Urban Air Mobility (UAM) Design for Indian Passengers using Virtual Reality (VR) Validation

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Electric vertical take-off and landing (eVTOL) is one of the different modes of public transportation explored worldwide, with its future prospects, also known as “Urban Air Mobility” or "Air Taxis", to carry passengers inside or across cities. To meet the growing commuting needs of public transportation in India, UAM is an opportunity that can be explored. Although several nations, including India, are developing Urban Air Mobility (UAM) aircraft designs, little research has been done on human interaction with them.

The aim of our study was to design Urban Air Mobility (UAM) aircraft based on preference validation from Indian passengers, focusing on the perception of safety and user experience. The study included a literature review of existing studies on UAM technology, passenger perceptions, user experience, visual safety, VR validation, and survey research.

The first phase of the study included a literature study concentrated on the existing development of UAM aircraft and a survey on the designs of five different UAM aircraft shared with the participants. Qualitative data was collected through interviews and surveys from Indian passengers, highlighting their prior aviation safety experiences and their acceptance of utilising UAM aircraft.

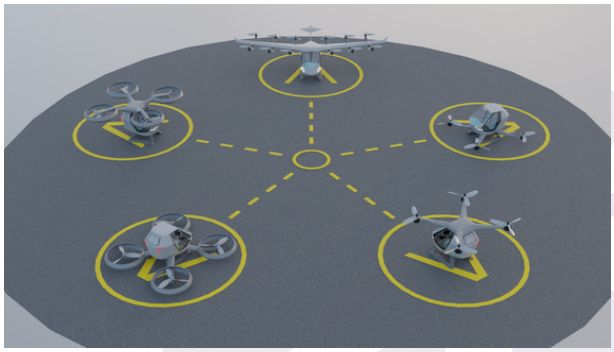

Figure 1: Design options of UAM placed in a vertiport environment.

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The second phase validated the design options (Figure 1) through VR simulations and survey research, with quantitative data analysed using statistical methods. By providing participants with an immersive experience of UAM design options (figure 2), VR validation research was conducted. A poll was then conducted to gauge participants' opinions of the UAM design preference based on acceptability and safety.

Figure 2: Immersive experience of UAM using VR.

From the visual safety standpoint, these two studies' findings were used to recommend and develop a digital UAM design for Indian passengers. Thus, a computer-generated 3d model of a potential Urban Air Mobility (UAM) aircraft (Figure 3) was created. This digital design helps incorporate preferred features and other specifications informed by the research.

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Figure 3: The design of the UAM aircraft, based on Indian passenger preferences

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